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Effect of Geometry and Film Thickness on Self-Cooling of SIN Junctions Intended for Particle Detector Applications

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We report on the effects of junction geometry and film thickness on self-cooling of the normal electrode of SINIS structures being developed for particle detector applications. We have adapted photolithographic fabrication techniques to produce these $Al/Al_2O_3/Cu$ devices (see paper by J.P. Castle *et al*). Cooling is evaluated by analyzing IV curves and also by exposing the devices to 6 keV X-rays and using a SQUID readout to measure the variation of pulse height with bias voltage (see analysis in the paper by J. Jochum *et al*). Incorporation of self-cooling SIN devices in a variety of detectors may permit the sensitivity advantages associated with operation at ultralow temperature to be achieved in devices operating at higher temperatures in cheaper cryostats.

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